

CYLINDROCARPON GALLS ON RED MANGROVE

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Mangroves are among the most abundant and perhaps most important plant species growing along Florida's extensive coastline and associated estuaries. Three species of mangroves, representing three plant families, occur in Florida: red mangrove = *Rhizophora mangle* L. (Rhizophoraceae), black mangrove = *Avicennia germinans* (L.) L. (Avicenniaceae), and white mangrove = *Laguncularia racemosa* Gaertn. f. (Combretaceae). In peninsular Florida, the red mangrove is most prevalent, distributed over a range extending from Levy County on the Gulf Coast, around the state's southern tip to Flagler County on the Atlantic Coast (Fig. 1).

Red mangrove is economically important in that it provides abundant detrital material upon which is based an estuarine food chain having direct effects on both commercial and sport fisheries. In addition, this species assumes ecological significance by way of providing valuable wildfowl habitat, buffering Florida's coasts against hurricanes, and aiding in coastal soil stabilization through erosion control.

Little is known regarding the types and significance of diseases affecting red mangrove in Florida. Olexa (2), however, provided a basis on which to build an understanding of the pathology of this species. One disease, which he studied and described, is a gall disease caused by the fungus, *Cylindrocarpon didymum* (Hartig)

Wollenw. This disease is similar, if not directly related, to a gall disease affecting *Rhizophora* spp. in West Africa (4). A description of the gall disease as it occurs in Florida is presented below.

SYMPTOMS AND INFECTION BIOLOGY. *Cylindrocarpon* galls on red mangrove commonly vary in size from less than 1 to 20 cm in diameter, depending upon their age, location, etc. They occur on trunks, branches, and prop roots. Bark on the surface of galled tissues is characteristically darkened and rough (cracked and/or fissured), especially with age (Fig. 2). Infections apparently occur through lenticels in the bark as opposed to wounds or insect feeding sites or galleries. Gall development is believed to be related to the production of indoleacetic acid by the fungus. Limited laboratory evidence suggests that mites are capable of disseminating the pathogen (2,3). Temperature (2) apparently plays a role in limiting the northerly distribution of the disease (Fig. 1).



Fig. 1. Distribution of *Rhizophora mangle* in Florida (1). Northernmost limits of *Cylindrocarpon* galls on east and west coasts indicated by bars at Mosquito Lagoon and Tampa Bay, respectively (3). (DPI Photo #702455)

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DISEASE IMPACT AND CONTROL. In some areas of southern Florida nearly 100% of the red mangroves are infected with *C. didymum*. To date, mortality resulting from infections has been considered minimal, the primary impact being predisposition of diseased trees to wind breakage where infections are abundant and/or severe (2,3). However, recent investigations suggest that in localized areas mortality may be more common than previously recognized (H. J. Teas and J. B. Reark - personal communication). Practical control measures are unknown at present.

SURVEY AND DETECTION. Look for globose to irregular swellings with dark, roughened bark on stems, branches, and/or prop roots.

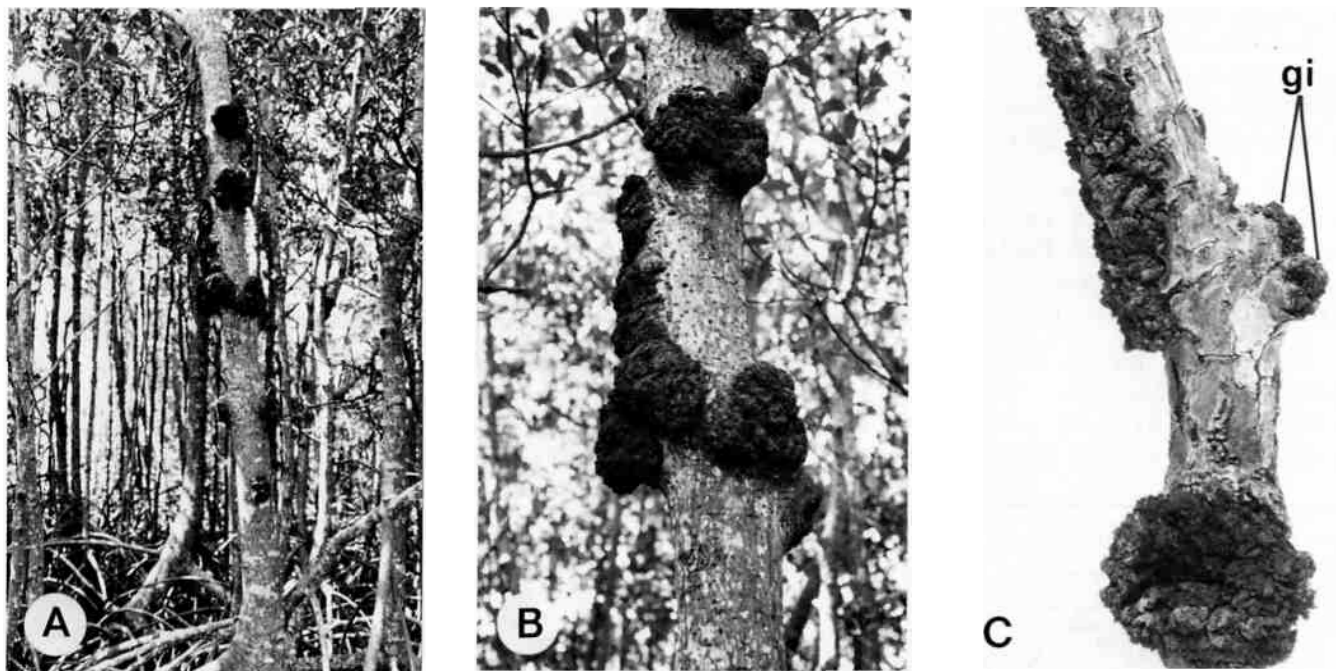


Fig. 2. *Cylindrocarpon* galls on red mangrove. A) Galled tree in mangrove swamp in Martin County. B) Stem galls magnified. C) Branch galls magnified showing gall initials (gi). (DPI Photo #702406-8)

LITERATURE CITED.

1. LITTLE, E. L., JR. 1978. Atlas of United States trees. Vol. 5. Florida. U. S. Dep. Agric. For. Serv. Misc. Pub. No. 1361.
2. OLEXA, H. T. 1976. The distribution, etiology, and importance of red mangrove diseases in Florida. Ph.D. Dissertation. Univ. of Florida. Sip.
3. OLEXA, H. T. , and T. E. FREEMAN. 1978. A gall disease of red mangrove caused by *Cylindrocarpon didymum*. Plant Dis. Rep. 62:283-286.
4. TEAS, H. J., and R. J. MCEWAN. 1982. An epidemic dieback gall disease of Rhizophora mangroves in the Gambia, West Africa. Plant Dis. 66: (in press).